A PLEA

FOR

Public Health Work in Villages.

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ROYAL COLLEGE OF SURGEONS OF ENGLAND
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BY

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ROYAL COLLEGE OF SURGEONS OF ENGLAND
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A Plea for Public Health Work in Villages.

By Henry B. Baker, M. D., *Secretary Michigan State Board of Health.*

When a fire breaks out in a village every person considers it a duty to give a general alarm, and especially, prompt notice of it to the fire department; and all citizens coöperate for the speedy extinction of the fire. If this were not done, the property in the village would be quite generally endangered by the possible spread of the fire. Why is it that when a dangerous communicable disease breaks out, one which may spread and endanger quite generally the lives of persons in the village, there is so frequently no such general alarm and prompt notice to a well-organized department of the village government, and no general coöperation for the extinction of the disease? Is not a person's life of more consequence than his property? Is not the saving of the lives of their children of as much consequence to the inhabitants of the village as the saving of their property? If each person were forced to answer this question, relative to his own children, I believe that he would feel like a degraded miserly wretch, if he did not promptly sacrifice his property in defense of the life of his child. Yet, collectively, the citizens generally do not do for the protection of *life* what they do for the protection of *property*—they do not maintain a well-organized health department so generally as they do a well-organized *fire* department. I believe it is because they do not so generally know that lives may be saved by well-organized health departments, or because they do not know the value of human life to the community.

It is the purpose of this paper to point out some of the ways in which lives may certainly be saved by a good health department, and to indicate something of the money value of human life; for, notwithstanding a general repugnance of people to weigh the life of fellow beings, and to estimate their value in dollars and cents, yet, in some way, it is important that people generally shall come to see that public health work in villages will "pay" in dollars and cents, as well as in the consciousness that the lives of loved ones are saved.

In order to be somewhat precise in our study of this subject, let us fix upon the size of the village which we will especially study; and, in order to have the figures in "round numbers" let us study especially the average village having about twenty-five hundred inhabitants. If we consider the usual death-rate from all causes to be about seventeen in each thousand inhabitants each year,* there will be, in our average village, forty-three deaths in each year.

Then about three of these deaths will have been caused by diphtheria, about one death will have been caused by scarlet fever, and about one from typhoid fever.†

Deaths reported, in the U. S. Census of 1880, as having occured in Pennsylvania, during the census year, from consumption, diphtheria, scarlet fever and enteric fever, and what the per cent. of deaths from each, and from all of these four diseases is of the deaths from all causes.

All deaths.	Sum of deaths from the four diseases.	Consumption.	Diphtheria.	Scarlet fever.	Enteric fever.
63.381	17.451	8.079	5.481	2.241	1.660
Per cent.	27.32	12.63	8.58	3.58	2.60

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* DEATH-RATE IN PENNSYLVANIA—CITIES.

CITIES.	Year.	Population.	Deaths.	Deaths reported to 1,000 inhabitants.
Reading,	1886,	52,250	861	16.4
Reading,	1885,	50,500	1,025	20.2
Reading,	1884,	49,000	917	18.7
Reading,	1883,	47,500	869	18.2
Reading,	1882,	45,750	890	19.4
Philadelphia,	1887,	989,431	21,719	21.9
Philadelphia,	1886,	971,363	20,005	20.59
Pittsburgh,	1886,	205,000	4,225	20.6
Pittsburgh,	1885,	195,000	3,840	19.7
Pittsburgh,	1884,	185,000	3,753	20.0
Scranton,	1886,	. .	1,067	13.33
Erie,	1886,	33,215	579	17.1
Erie,	1885,	36,008	477	13.2
Erie,	1880,	27,730	490	17.7

The average death-rate=18.36 per thousand inhabitants.

The average death-rate in the city of Philadelphia for fifteen years, 1871–1885, is 21.87. $21.87 \times 15 = 328.05$. $328.05 + 257.02 = 585.07$. $585.07 \div 29 = 20.18$. Thus, the average death-rate for the above cities for the years as above; but Philadelphia for seventeen years instead of for two years=20.18.

† The proportions which the deaths from certain dangerous communicable diseases are of the deaths from all causes in Pennsylvania are shown, for a single year, in the following table: and a similar table shows the same for the State of Michigan; but there is reason to believe that in a long series of years they would not be so large as they were in the census year. The last table for Michigan, for a long series of years, is probably near the truth for Pennsylvania as well as for Michigan.

Deaths reported in the U. S. Census of 1880, as having occurred in Michigan, during the census year, from consumption, diphtheria, scarlet fever and enteric fever, and what the per cent. of deaths from each and from all of these diseases is of the deaths from all causes.

All deaths.	Sum of deaths from the four diseases.	Consumption.	Diphtheria.	Scarlet fever.	Enteric fever.
19.734 Per cent.	5.672 28.73	2.602 13.18	1.995 10.10	5.28 2.67	5.47 2.77

*The number of reported deaths, from all causes, in Michigan during the thirteen years, 1874–86 ; also the number of reported deaths from consumption, diphtheria, scarlet fever and typhoid fever, during the same period, and what the per cent. of deaths from each, and from all of these four diseases is of the deaths from all causes.**

All deaths.	Sum of deaths from the four diseases.	Consumption.	Diphtheria.	Scarlet fever.	Typhoid fever.
198.718 Per cent.	48.253 24.3	23.496 11.8	12.998 6.5	5.423 2.7	6.386 3.2

By the above table it will be seen that 3.2 per cent. of all deaths have been from typhoid fever, 2.7 per cent. from scarlet fever, 6.5 per cent. from diphtheria, and 11.8 per cent. from consumption ; and that 24.3 per cent. of all the deaths have been from these four diseases, which are now believed to be in great part preventable by measures which are practicable, by intelligent people, in connection with the services of an intelligent and efficient local health officer, coöperating with a state board of health.

In any one particular village those diseases may not occur every year, but in the average village they will occur ; and in a long series of years the deaths from these diseases in each and all of the villages of this size will average rather more than the figures I have just mentioned.

I have selected these three diseases (diphtheria, scarlet fever and typhoid fever), because these are the most common dangerous communicable diseases, and because they are diseases which we know how to prevent ; and we know how to restrict them after they have been introduced into a community. On this point, as I am more familiar with the evidence collected in my own state than with that collected by your State Board of Health in Pennsylvania, I will present to you a few facts collected in Michigan :—

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*Compiled from Registration Reports of Michigan.

Diphtheria.

In 1886, 464 outbreaks of diphtheria were reported to the office of the Michigan State Board of Health, and the health officers were requested to report just what was done to restrict the disease, and how many cases and deaths occurred in each outbreak. From these reports it is possible to see under what conditions the most cases occur. The results of this inquiry are graphically exhibited in a diagram, copies of which are here for distribution to each of you who may be interested. In this diagram, by comparing the last two columns with the two immediately preceding, it will be seen that in those outbreaks in which the isolation of infected persons and things, or their thorough disinfection, after death or recovery, was neglected, there were about five times as many cases and five times as many deaths as there were in those outbreaks in which both isolation and disinfection were enforced. This is equivalent to saying that by complete isolation of those sick with diphtheria, and the thorough disinfection of all infected persons and things, at least four-fifths, in other words *eighty* per cent., of the cases of diphtheria, and of deaths from that disease, have been prevented by restricting the disease, after it has been introduced into the localities. Similar facts were shown by the statistics for the year 1887, and by those for 1888. For the year 1888 we compiled the reports so as to show the results when both isolation and disinfection were neglected; and it was shown, as would be expected, that, compared with this, the saving by isolation and disinfection was greater than eighty per cent. of the cases. The average of the three years' experience shows a saving of over seventy-seven per cent. of the deaths.

It is proved, then, that if we employ the measures with which we are familiar, and which are described by three words—isolation and disinfection—we can prevent, say seventy-five per cent. of the deaths which otherwise will occur from diphtheria.

Scarlet Fever.

Similar reliable statistics, collected by the Michigan State Board of Health, have proved that, after the disease is introduced, eighty per cent. of the deaths which otherwise would occur from scarlet fever, can be prevented by thorough isolation and disinfection of all infected persons and things. Copies of a diagram exhibiting facts relative to scarlet fever in Michigan during the year 1886 are here for distribution.

Typhoid Fever.

Such absolute proof of the accomplishment of the restriction of typhoid fever as I have given you relative to diphtheria and scarlet fever, I have not here to present to you; but, theoretically, typhoid fever is more easily restricted and prevented than is either diphtheria or scarlet fever; because it is not usually spread directly from person to person; and it may be restricted by the thorough disinfection of everything which comes from the patient; and it may be in great part prevented by drinking no water except that which has been sterilized by having been boiled.

It has been said that for every death from typhoid fever some person should be held criminally responsible. This implies that the disease is preventable, and that it is the *duty* of *every* person to know how it may be prevented.

In common with other state boards of health, the Pennsylvania State Board issues copies of a pamphlet (Circular No. 18) giving brief directions how to restrict typhoid fever. By complying with its directions, at least eighty per cent. of the cases and of the deaths which otherwise will occur from that disease may probably be prevented. If we save seventy-five per cent. of the sickness and seventy-five per cent. of the deaths from diphtheria, scarlet fever and typhoid fever, what does this amount to in the average village or borough of twenty-five hundred inhabitants? Let us see.

We have seen that the average village of that size has in each year, on the average, about three deaths from diphtheria, one from scarlet fever and one from typhoid fever. From the two last mentioned diseases the average is rather more than one death, so that seventy-five per cent. of the deaths would amount to about one death from each disease each year. Seventy-five per cent. of the deaths from diphtheria would equal two deaths, annually. From the three diseases, then, four lives would be saved. The three saved from diphtheria and scarlet fever will be under ten years of age, and the person saved from death by typhoid fever will be in the middle age—in the "prime of life."

When lives of young or middle-aged persons are lost to a community something else is lost, namely their prospective earnings,—the wealth which otherwise they would have created. There are several ways of estimating the extent of this loss. A few years ago a good negro slave was valued, for what he would earn in excess of the cost of his keeping, at about eight hundred dollars; statisticians would value a person in the prime of life as worth to the community about one thousand dollars. Children are worth as much less as it will cost to raise them to the most productive age. If the three children which may easily be saved in the average village, are estimated as worth half the full average value of a person then if their lives are saved there is a saving of fifteen hundred dollars; and if the one adult life is saved from typhoid fever, there is a saving of a thousand dollars—and, from the three deaths prevented, a saving of twenty-five hundred dollars—a dollar for each inhabitant of the village.

Facts, which I consider incontrovertible, prove beyond reasonable doubt that, in the average village or borough of twenty-five hundred inhabitants in Pennsylvania, this average annual saving of lives and of money value may be easily accomplished, with reference only to the three diseases I have mentioned; leaving out of the account all saving of sickness, and all saving from deaths which may occur from other diseases. Surely the saving of these lives is well worth the effort of your people! The exact methods of work may be stated further on, but it will require the general coöperation of the citizens of the village; it cannot be done except by *organized* coöperation. In other words, it will require an efficient local health officer; and then the citizens must coöperate with the *health* department of the village as promptly and thoroughly as they now do with the fire department. It will require such a public opinion as will hold the health officer steadfastly to his duties, and such as will pay him so well for his services that he can afford to do his best for the *prevention* of disease, leaving to other physicians the care of those already sick. To do this requires money—money by the hundreds, perhaps by the thousands, of dollars, every year, but I have proved that, by such work as can be done by and in connection with an effcient local health officer, with reference to three diseases alone, there can easily be saved in each average year, lives which at ordinary estimates would add to the wealth of the community at least twenty-five hundred dollars. If, then, our average village shall expend twenty-five hundred dollars a year in public health work, it will only be paying, to the health officer, and a few others, as much as without such payments is actually lost to the people of the place. Is it not better to pay this money for public-health service, than to bury that of as much actual money value in the graveyard?

We will admit, if you please, that when deaths occur the loss is not equally distributed among the people of the village; generally the loss falls most heavily upon the bereaved family; and this is especially true if the death is of the bread-winner of the family. But it should not require much argument to show that the prosperity of a village depends greatly upon its healthfulness and the safety of life therein, and that, in a long series of years, the deaths are distributed somewhat equally among the people, and that, even if they were not equally distributed, a high moral sentiment should prompt us to guard the common safety of life among us. It was recognized even before the Declaration of Independence, that to each citizen the right to exist, the life of the individual is among the unalienable rights to secure which "governments are instituted among men." It is plain, therefore, that one of the highest, perhaps the very highest, function of a government is to guard the *lives* of the people.

Having reference, then, to only *three* of the most important communicable diseases, it seems plain that the average village has the undoubted right, and can well afford to expend, in every year, two thousand five hundred dollars, for the restriction and prevention of diphtheria, scarlet fever and typhoid fever. And I think there is good reason to believe that the citizens of the average village would incidentally save lives and cases of sickness from other diseases than those I have mentioned; and, besides, in my account of losses by those three diseases, I accounted only for the losses by reason of the deaths, leaving out of the account all the great expenses incident to the sickness.

What is the Exact Nature of the Work to be Done?

I would not have the health officer, or the board of health neglect any duty which is now required by law or custom. Nuisances should be abated; even if there is no absolute certainty as to just how they may cause sickness. House-to-house inspections by the health officer may well be maintained at regular intervals. Such inspections yield knowledge useful by the the health officer in some of his duties, as, for instance, those for the prevention of typhoid fever. But none of these things, which it has so long been considered the sole duty of the health officer to attend to, have much to do with the restriction or prevention of scarlet fever, and probably not with diphtheria. For that work entirely new methods must be employed. To do this work, the health officer, and the people who coöperate with him, must have a good theoretical knowledge of the "germ theory of disease."

A few years ago it was generally believed that all we had to do to protect ourselves from all the dangerous diseases was to clean up and to keep clean; it was thought that these diseases were all produced in filth. Now we know that this is not true; that while typhoid fever probably is reproduced in filth, outside the body, or, if its specific cause is not reproduced, certainly it is *stored* in the filth outside the dody, and all ordinary measures of cleanliness are important for the prevention of that disease, it is not true that all diseases are thus caused, or that anything worthy of mention can be done for the prevention of some of the most dangerous of them by attention to ordinary cleanliness. To show how strong the evidence on this subject is, I may mention that for several years there has been offered a prize of a thousand dollars to any person who shall demonstrate the possibility of reproducing, outside the animal body, the vaccine virus or the modified virus of small-pox capable of preventing small-pox in the way well known to be accomplished by vaccine virus propagated in man or animals. No one has claimed the prize. It seems to be impossible to find or create any conditions outside the living body which will enable this contagium to reproduce. There is no reliable evidence that the contagium of scarlet fever is reproduced in filth outside the body. There is question whether the contagium of diphtheria can be reproduced outside the body, and still more question whether, in ordinary life, it is so produced. One of the things which makes it improbable that it is so reproduced is the fact, proved by the statistics supplied by hundreds of health officers in

Michigan, that simply by the isolation of infected persons and things, and their thorough disinfection, three-fourths of the cases and deaths from diphtheria which otherwise would occur are prevented. If the disease were generated in or by ordinary filth it does not seem probable that isolation and disinfection would be so very effectual for its restriction and prevention. But it has been abundantly proved, that the contagium from any person, even if it cannot grow or multiply outside the body, yet can lie for months dormant but virulent to produce the disease whenever it is breathed in by a susceptible person; that this contagium clings to clothing, books, letters, papers, walls of rooms, curtains and articles of furniture, and may thus re-produce the disease long after the recovery of the person in whose body the contagium was formed; that, therefore, time alone cannot be relied upon to protect us from the contagium; that no ordinary cleanliness can protect us from it; that nothing is available for this purpose short of some gaseous disinfectant which will follow the contagium to the uttermost recesses of all cracks and crannies, and will then and there attack and destroy its life. The mode of disinfection which has proved effective for the prevention of scarlet fever and diphtheria in Michigan, is the exposure of all infected things to the fumes of burning sulphur; and the state board of health recommends that the fumes be as strong as will be made by the burning of three pounds of sulphur in a room ten feet square, or in each thousand cubic feet of air space. Discharges from the throat and mouth are to be taken on rags, and immediately burned. But for complete directions I must refer you to the pamphlets published by our own state board of health.

It is important that we maintain a local health service so that, at a moment's notice, all the measures for the complete isolation of a person sick with one of these dangerous communicable diseases shall immediately be put in operation; that, at any time, the appropriate disinfectants, for use in the sick room and after the recovery or death of the patient, shall be ready, and shall be faithfully and intelligently used. It is important that every village have at all times, an efficient local health service so that, in case of need, it can have the benefit of the aid which can be rendered by the state board of health. A good health officer is powerless to protect a village unless he is supported by the people. In order that the people shall support him in strong measures for the restriction of infected persons and things, they must know wherein lies the danger, must appreciate the importance of restrictive measures, they must know how isolation and disinfection are accomplished, and how they may be made imperfect, and deaths result. This coöperation of the people, which is so important, can be had if they can be led to see the truth, and they can be led to see the truth if it is presented to them in the right way at the right time. In an outbreak of scarlet fever, or diphtheria, if prompt notice be given to the local health officer, and by him to the State Board of Health, the local health officer can promptly be supplied with pamphlets which tell, in brief language, just how to restrict that particular disease; and if the health officer distributes these pamphlets to the *neighbors* of the family in which the disease is, they will then be likely to read and to pay attention to the best methods of preventing the spread of the disease into their own families.

This may serve as a hint as to some of the ways in which an efficient local health service coöperation with the State Board of Health, and securing the coöperation of the neighbors of those sick with communicable disease, may act for the protection of life and health in the locality.

The State Board of Health publishes full and valuable instruction to those health officers who are for the first time elected for that service. These instructions also serve as reminders to those health officers already familiar with the duties of the office, also to call attention to any new law which may have passed by the legislature, or any and useful facts which may have been learned from the compilation of the reports collected by the State Board of Health. Thus every locality that maintains an efficient health service which is actively in harmony with the State Board of Health, contributes to and has the benefit of the combined experience of all the other similar boards of health throughout the state, and in fact of all the experience of similar organizations throughout the world; because the State Board of Health is constantly exchanging reports of its work for the accounts of the work of other health officers and boards throughout the world. There is an old saying that "Dwarfs see far on giants' shoulders." This may serve to fix in our minds the fact that a very humble and ordinary person acting as local health officer in any ordinary village, may accomplish great results by life-saving measures when he is lifted up and borne forward on the shoulders of all of mankind who are engaged in similar work, as he may be so aided if he puts himself in the way of such aid. In this work the "Giants" are always in existence—in many places throughout the world excellent public-health work is constantly being done and reported; but I fear that it frequently happens that a village in Pennsylvania fails to provide even a "Dwarf" to act as a local health officer. I should be glad if each village or borough in Pennsylvania would constantly employ the best physician within its limits, to act as its sanitary adviser and health officer; one who would put himself on the shoulders of all the "Giants" in sanitary science and public-health work in Pennsylvania and throughout the world; one who would be constantly employed for the prevention and, when required, for the restriction of disease; and one who would thus save to the people of this village not only as much in money value as is expended for public-health work, but also prevent a vast amount of pain, of sickness and of agony, and save the lives of children and other loved ones who, without such public-health work, are constantly being torn from their parents, relatives and friends.

This is why I plead for the establishment, and for the permanent maintenance, of an efficient public-health service in every village. If there is as yet no law whereby every village, borough or inhabited locality in Pennsylvania can maintain an efficient local health service, I earnestly hope that your legislature will pass such a law, as soon as possible, and that, by governmental forms, which they will respect and obey, the people of this great state may have guaranteed to them "Life, Liberty and the Pursuit of Happiness," which *can* be only through their protection and exemption from sickness and deaths from preventable causes.